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ABSTRACT

This is an annotated bibliography of selected energy education materials. The materials included in this document are indexed according to grade level and according to whether they are background materials or classroom activities. Each of the 100 items listed were evaluated and included into either the "A" list or the "B" list. The "A" list contains activities and background materials that were judged to be somewhat better by virtue of: (1) content included; (2) activities; (3) ease of use; (4) background material; and/or (5) reference provided. The "B" list contains activities and background materials which cover a wider range of subjects and approaches and may be used as the core of or as supplements to energy units. In addition to the usual bibliographic information, such as title, author, publisher/source, other information included is: (1) suggested grade levels; (2) suggested subject areas; (3) media type; (4) cost and date issued; (5) types of activities; (6) energy topics; (7) approaches; (8) student outcomes; (9) what teacher background is assumed; and (10) general comments. Also indicated is whether materials are designed for use by students, teachers or both. (MR)

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ENERGY EDUCATION MATERIALS BIBLIOGRAPHY

MINNESOTA ENERGY AGENCY

JUNE, 1978

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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ENERGY MATERIALS ASSESSMENT PROJECT

The Minnesota Energy Agency ran a Materials Assessment project for curriculum materials in energy during the summer and fall of 1977. Materials reviewed included books and media packages from educational publishers, school districts nationwide, and state and federal agencies.

The three main objectives of the assessment were: 1) to compile an annotated bibliography to meet the increasing demand from teachers who want energy curriculum materials; 2) to survey available materials for information which might help the Department of Education develop Minnesota energy curriculum units; and 3) to acquire a collection of films and filmstrips for loan (at no charge) to teachers.

Many of the curriculum materials reviewed were "in-house" school district publications and are not generally available outside the district. One hundred of the materials which are available were chosen for the annotated bibliography. The materials are indexed according to grade level and according to whether they are background materials or classroom activities. Copies of the printed materials reviewed are in the Minnesota Energy Agency Library and may be used there.

EXPLANATION OF EVALUATION FORMAT

Each item was evaluated for content, subject areas, grade levels, points of emphasis, and teacher background necessary. In general, the suggested subject areas should not be taken as too restrictive, for many of the materials can be used on an interdisciplinary basis.

If the material is in a format which the students will read or view directly, it is designated as **Student Material.** If it is in a format where the teacher explains activities and concepts to the group (such as Teacher's Guide) it is classified as a **Teacher Resource.** Some media packages contain both student and teacher materials. Other materials are designated as **General Information:** these are not specifically classroom-oriented.

The **Approaches** section notes whether the material is sequenced, open-ended, value-clarification, etc. Some of the emphases and biases of the material are noted.

The **Student Outcomes** in many of the materials are not clearly identified. If the outcomes are identified, the evaluation indicates whether they are cognitive or affective.

The **Teacher Background Assumed** section tries to identify extra background a teacher might need for the material, and suggests types of support materials, if applicable. It also identifies background information (diagrams, glossary, bibliography) found in the material.

Many teachers requested that the "best energy curriculum materials" be identified. To meet this request, the evaluated materials have been divided into two lists, each identifying curriculum activities and background materials. These lists should not be taken as unchangeable, for obviously no single set of materials will be "best" for every school class in the state.

In general, the "A" list contains materials judged to be somewhat better by virtue of content included, activities, ease of use, background material, and/or references provided. Most "A" list materials demand little or no extra teacher background. This list provides a starting point for energy activities and background information.

The "B" list, however, also contains many useful materials which could be used as the core of, or as supplements to, an energy unit. It contains a wider range of subjects, approaches, and types of materials. Some of these demand more teacher background or more back-up materials in the classroom. The "B" list also contains a number of items identified as representing specific points of view (oil company, consumer advocate, etc.) which would be important in values and lifestyle discussions. Teachers putting together a larger unit on energy are strongly encouraged to review the "B" list.

A brief listing of films and filmstrips is also available from the Minnesota Energy Agency. These audio-visual materials are available for loan without charge. For further information contact:

Information and Education Activity
Minnesota Energy Agency
980 American Center Building
150 East Kellogg Boulevard
St. Paul, Minnesota 55101
612/296-5769 800/652-9028

"A" LIST

ACTIVITIES

K-12

Award Winning Energy Education Activities (NSTA/ERDA)
Energy Activities for the Classroom (Coon & Alexander)
Energy & Conservation Activities for Classroom (EME)
Energy-Environment Mini-Unit Guide (NSTA)
The Energy We Use: Teacher Guide (NSTA)
Interdisciplinary Student/Teacher Materials in Energy, The Environment & Society (NSTA)

Elementary

Energy All Around (Pine & Levine)(2-4)
Energy Conservation Activity Packet (Iowa Policy Council)(K-6)
Experiments from Edison (Benrey & Schultz)(5-12)
Home Sweet Earth (Highline Schools)(K-3)
Only Silly People Waste (Smaridge)(K-4)
Science Activities in Energy (Oak Ridge)(4-9)
Tilly's Catch a Sunbeam Coloring Book (Spetgang)(2-4)
Your Energy World (Department of Energy)(5-8)

Junior High

Energy Activities for Junior High Science (MN Department of Education/Minnesota Energy Agency)(7-12)
Energy Activities for Junior High Social Studies (MN Department of Education/Minnesota Energy Agency)(7-12)
Energy/Consumerism: Home Economics (MIMC)(7-12)
Energy & Ecology: A Newsbook (Reading Laboratory)(7-12)
Energy Education in the Home: An Energy Education/Conservation Curriculum Guide for Home Economics Teachers (University of Tennessee)(7-12)
Energy, Food, and You (Washington State)(7-12)
Experiments from Edison (Benrey & Schultz)(5-12)
Heatloss (MN Department of Education)(7-up)
Household Energy (Ginn)(7-12)
Science Activities in Energy (Oak Ridge)(4-9)
Your Energy World (Department of Energy)(5-8)

Senior High

Discover Energy Series (Harris)(10-12)
Energy (kit from Xerox)(10-12)
Energy/Consumerism: Home Economics (MIMC)(7-12)
Energy Activities for Junior High Science (MN Department of Education/Minnesota Energy Agency)(7-12)
Energy Activities for Junior High Social Studies (MN Department of Education/Minnesota Energy Agency)(7-12)
Energy Conservation: Understanding & Activities for Young People (FEA)(7-up)
Energy & Ecology: A Newsbook (Reading Laboratory)(7-12)
Energy Education in the Home: An Energy Education/Conservation Curriculum Guide for Home Economics Teachers (University of Tennessee)(7-12)

Senior High (Continued)

Energy, Food and You (Washington State)(7-12)
Energy and Order (Terry & Witt)(10-up)
Energy and Society: Investigations in Decision Making (BSCS)(10-up)
Energy X (kit from Ideal School Supply)(10-12)
Experiments from Edison (Benrey & Schultz)(5-12)
Household Energy (Ginn)(7-12)
The Hydrocarbon Civilization (MESFI)(10-up)
Solar Energy Experiments for Secondary Students (Norton)(10-up)

College Text

Physics: Energy in the Environment (Saperstein)

"A" LIST

BACKGROUND MATERIALS

K-12

Energy Glossary (EME)

Elementary

Energy from the Sun (Berger)
Energy: Its Past, Its Present, Its Future (Gutnik)
Heat: A First Book (Cobb)
Push! Pull! Stop! Go! A Book About Forces and Motion (Lefkowitz)
The Sun (Zim)
Why Things Work: A Book About Energy (Benedick)

Junior High and Up

Chains, Webs, and Pyramids (Pringle & Adkins)
Energy and Power (Irving)
Harnessing the Sun: The Story of Solar Energy (Knight)
Heat: A First Book (Cobb)
Push and Pull: The Story of Energy (Blackwood)
The Sun (Zim)
Underground Furnaces: The Story of Geothermal Energy (Kiefer)

Senior High and Up

The Coming Age of Solar Energy (Halacy)
Energy/Environment Source Book (Fowler, NSTA)
Energy: A Glossary (Maugh, AAAS)
Energy: The Solar Prospect (Hayes)
The Energy Trap (Halacy)
Kilowatt Counter (Friend and Morris)
Nuclear Energy: Skeptic Issue #14

College and Teacher

Energy and Environment: Four Crises (Miller)
Fact Sheets (Fowler, NSTA)

NOTE: A number of books cited can be used on more than one level. Some of the simpler format, junior high books, for example, contain simple statements of high school level concepts. Books are listed at lowest appropriate level.

"B" LIST

ACTIVITIES

K-12

Energy Book (South Carolina Department of Education)
Energy and Man's Environment – Activity Guide (Ris)
Science 5/13 (Nuffield Fdn)

Elementary

Energy Activities (Natural Gas Council)(4-12?)
Energy Activities with Energy Ant (FEA)(2-5)
The Energy Crisis: What You Can Do About It (Standard Oil)(3-7)
Energy and Man's Environment – Activity Guide (EME)(4-12)
Power (Minneapolis Public Schools)(3-6)

Junior High and Up

Deciding How to Live on Spaceship Earth (Ulrich, et al)(7-12)
Energy Activities (Natural Gas Council)(4-12?)
The Energy Crisis: What You Can Do About It (Standard Oil)(3-7)
Energy and Ecology: Are You Involved (Youth Ed.)(7-12)
Energy Futures (Highline Public Schools (7-9)
Energy and Man's Environment: Activity Guide (EME)(4-12)
The Household Energy Game (Smith & Jenkins)(7-up)
Ideas and Activities for Teaching Energy Conservation (University of Tennessee)(7-12)
Priority One: Environment, the Energy Challenge (Pollution Control Education Center of New Jersey)(7-12)

Senior High and Up

Deciding How to Live on Spaceship Earth (Ulrich, et al)(7-12)
Energy Activities (Natural Gas Council)(4-12?)
Energy and Ecology: Are You Involved (Youth Ed.)(7-12)
Energy and Man's Environment: Activity Guide (EME)(4-12)
Energy: Science World Visuals 3 (Scholastic)(10-12)
Energy, Structure, Life (Bixby, et al)(10-up)
Environmental Impact of Electrical Power Generation Nuclear and Fossil Fuel (Penn. Dept. of Education)(10-up)
The Household Energy Game (Smith & Jenkins)(7-up)
Ideas and Activities for Teaching Energy Conservation (University of Tennessee)(7-12)
Living with Energy (Standard Oil)(10-12)
Nuclear Science (Penn. Dept. of Energy)(10-up)
Priority One: Environment: The Energy Challenge (Pollution Control Education Center of New Jersey)(7-12)
The Student Scientist Explores Energy and Fuels (Kaplan & Lebowitz)(10-12)
What's the Matter With Energy (Ed Research Council of America)(10-12)

College Text

Energy (Crawley)
Energy: Resource, Slave, Pollutant (Rouse & Smith)
Environment: A Human Crisis (Piburn)

"B" LIST

BACKGROUND MATERIALS

K-12

Energy Education Bibliography and Film Index (EME)

Elementary

Hot as an Ice Cube (Balestrino)

Junior High and Up

Black Gold: The Story of Oil (Butterworth)
Energy (Adler)
Energy Conservation: An Overview (American Petroleum Institute)
Energy and the Future (Rothman)
Energy: Power for People (Pringle)
First Book of Energy (Harrison)
The Whole Earth Energy Crisis (Woodburn)

Senior High and Up

Alternative Sources of Energy (Eccli)
American's Oil Famine: How It Happened and When It Will End (Sheldan)
The Energy Balloon (Udall)
The Energy Crisis (Szuk)
Energy: 1978 Where America Stands on Energy Crisis (3M)
Energy in the World of the Future (Hellman)
Facts About Oil (American Petroleum Institute)
Fact Sheets (Committee for Environmental Information)

College and Teacher

Beyond the Energy Crisis: A Global Perspective (Maddox)
Black Mesa: The Angel of Death (Gordon)
Energy Conservation: An Overview (Teacher's Packet from American Petroleum Institute)
Energy Crisis: Danger and Opportunity (Yannacone)
Energy, Earth, and Everyone: A Global Strategy for Spaceship Earth (Gabel)
Energy Education: An Overview and Resource Guide (Mankato)
Energy Education Bibliography and Film List (MEA)
Energy: Future Alternatives and Risks: Academy Forum (National Academy of Sciences)
Natural Energy Workbook (Clark and Landfield)
Solar Energy: Technology and Applications (Williams)

NOTE: A number of books cited can be used on more than one level. Some of the simpler format, junior high books, for example, contain simple statements of high school level concepts. Books are listed at lowest appropriate level.

"A" LIST
ACTIVITIES

ENERGY MATERIALS EVALUATION

Title: Award Winning Energy Education Activities

Author: ed. by Helen Carey and NSTA **Issue Date:** 1977

Suggested Grade Levels: 2 – 12

Suggested Subject Areas: economics, home ec. consumerism, math, design, science, physical science, art, social studies, drafting

Media Types: 38 page booklet

Teacher Resource

Cost: free

Source: ERDA Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830 (publication #ERHQ-0011)

Energy Topics: sources, recycling, economics, use, definition, forms

Types of Activities: class discussions and projects, role playing, experiments, math, design problems

Approaches: this is a collection of ten award winning units selected by National Science Teachers Association

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? varies with different activities; very little background material is provided

Other/General Comments: this is a good, varied idea list of activities

Title: Discover Energy Series

Author: Margery Harris **Issue Date:** 1975

Suggested Grade Levels: high school

Suggested Subject Areas: physical science, values, civics, social studies, future

Media Type: five dittoed booklets

Teacher Resource

Cost: $10.30

Source: Ecology Center, 417 Detroit Street, Ann Arbor, Michigan 48104

Energy Topics: 1) What is Energy; 2) Development of Energy Resources in Human Ecosystem; 3) The Fossil Fuel Story; 4) Nuclear Power; 5) Energy Options

Types of Activities: discussion, research, simulations, a few lab experiments

Approaches: presentation of fairly extensive background information accompanied by suggested activities; emphasizes hazards of nuclear power generation; basically has environmentalist viewpoint

Student Outcomes: Clearly Stated? No **Areas:** Cognitive; Affective

What Teacher Background is Assumed? extensive background given, including diagrams, glossary, bibliography; nuclear booklet recommends teacher should be able to lead value discussions

Other/General Comments: well done bookets; highly usable for a sequence on energy

ENERGY MATERIALS EVALUATION

Title: Energy

Author: Xerox Publications **Issue Date:** 1974

Suggested Grade Levels: high school

Suggested Subject Areas: social studies, values, American problems, civics, economics

Media Types: filmstrip, cassette, teacher's guide, 20 student booklets, 16 spirit masters, 8 tests, 8 additional surveys

Teacher Resource; Student Material

Cost: $39.95

Source: Xerox Educational Publications, 245 Long Hill Road, Middleton, Connecticut 06457

Energy Topics: oil use, supply energy future, future sources, economy

Types of Activities: worksheets, separate readings with review quizzes on each topic, discussions on values and lifestyles choices

Approaches: readings coupled with activities, to be used in an entire unit starting with filmstrip; the filmstrip has a proponent of nuclear energy discussing it with an opponent; the discussions present excellent, relevant, knotty value conflicts

Student Outcomes: Clearly Stated? No **Areas:** Cognitive; Affective

What Teacher Background is Assumed? not nuch required; a fairly complete unit package; no bibliography or glossary; teacher should feel comfortable conducting values discussions; more background material on nuclear energy and other alternatives would be useful

Other/General Comments: contains some excellent worksheets with penetrating insights into conflicts of interest in the energy situation

Title: Energy Activities for the Classroom

Author: H. L. Coon and M. Y. Alexander **Issue Date:** 1976

Suggested Grade Levels: K-12

Suggested Subject Areas: social studies, science

Media Types: 148 page booklet

Teacher Resource

Cost: $4.00

Source: ERIC Center for Science, Math & Environmental Ed., College of Education, Ohio State U, 1200 Chambers Road, Columbus, OH 43210

Energy Topics: sources, conversion, distribution, conservation, waste

Types of Activities: discussion, demonstration, simple lab experiments, research

Approaches: a lot of listing and discussing and reporting on one's family's energy use pattern, activities arranged around stated concepts, and divided by grade and subject

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? none, although a teacher would want support information

Other/General Comments: the collection of activities is uneven, it does contain several good ideas, however, activities are all suggested by teachers

ENERGY MATERIALS EVALUATION

Title: Energy Activities for Junior High Science

Author: Minn. Energy Materials Task Force **Issue Date:** 1977

Suggested Grade Levels: junior high and above

Suggested Subject Areas: science

Media Types: folder with six activity cards plus worksheets

Teacher Resource

Cost: free

Source: Minnesota Dept. of Education (Attn: Roger Wangen or Dick Clark), Capitol Square Building, St. Paul, MN 55101

Energy Topics: solar, definitions and properties of energy, use, forms, conservation

Types of Activities: experiments, discussions, listing, math exercises on energy consumption

Approaches: materials combine simple experiments with suggested discussions and challenges to students' creativity in developing designs and experiments; there is a value exploration orientation

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? no special background assumed, other than some basic knowledge of physical science principles; a few references are listed

Other/General Comments: a well-designed series of activities which could also be used for upper grades; teacher should look at social studies activities from same source

Title: Energy Activities for Junior High Social Studies

Author: Minn. Energy Materials Task Force **Issue Date:** 1977

Suggested Grade Levels: junior high and above

Suggested Subject Areas: social studies

Media Types: folder with seven activity cards plus worksheets

Teacher Resource

Cost: free

Source: Minnesota Dept. of Education (Attn: Roger Wangen or Dick Clark), Capitol Square Building, St. Paul, MN 55101

Energy Topics: peat as a fuel, energy reporting in media, future, use, alternative lifestyles

Types of Activities: simple experiments, newspaper reading, surveys, future wheel, interviews, discussions

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? no special background needed; some reference sources are listed

Other/General Comments: a well-designed set of activities, many of which are also suitable for higher grades and adults; teacher should look at science activities from same source

ENERGY MATERIALS EVALUATION

Title: Energy All Around

Author: Tillie S. Pine and Joseph Levine **Issue Date:** 1975

Suggested Grade Levels: 2 – 4 (may need reading help)

Suggested Subject Areas: science

Media Types: short book

Student Material

Cost: $5.72

Source: McGraw Hill, 1221 Avenue Americas, New York, NY 10020

Energy Topics: what energy is, how it's transferred and converted

Types of Activities: contains background information and simple experiments, sequenced

Approaches: open-ended, discovery

Student Outcomes: Clearly Stated? No **Areas:** Cognitive; Affective

What Teacher Background is Assumed? no background assumed, concepts stated simply in several different ways, with many examples

Other/General Comments: good treatment of energy at beginning level with many easy activities to involve kids

Title: Energy Conservation Activity Packet

Author: Iowa Dept. of Public Instruction
Iowa Energy Policy Council **Issue Date:** 1977

Suggested Grade Levels: K – 6

Suggested Subject Areas: interdisciplinary, includes social studies, language arts, science

Media Types: five plastic-bound notebooks, arranged by grade

Teacher Resource

Cost: $2.00/each level – $10.00/set

Source: ERIC, Center for Science, Math and Environmental Education, Room 310, 1200 Chambers Road, Columbus, OH 43212

Energy Topics: use, sources, scarcity, conservation, lifestyle

Types of Activities: discussions, library research, simple demonstrations and experiments; they are open-ended and unsequenced

Approaches: this collection intersperses background sections for the teacher with suggested activities and activity sheets for students; it contains many value choice types of activities

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? varies with activity; a good bibliography is included

Other/General Comments: the levels of many activities seem somewhat uneven, with skills demanded not consistent with concept or vocabulary level; teacher should look at lower grade level materials as well as that for grade taught; in general, this is a useful, well-organized collection

ENERGY MATERIALS EVALUATION

Title: Energy and Conservation Education: Activities for the Classroom

Author: John Jones, et al **Issue Date:** 1977

Suggested Grade Levels: K – 12

Suggested Subject Areas: interdisciplinary; also separated by specific subjects

Media Types: 4 large ring-bound notebooks, separated by grade levels

Teacher Resource

Cost: $72.00

Source: Energy and Man's Environment, 0224 SW Hamilton, Suite 301, Portland, OR 97201

Energy Topics: sources, uses, conversion, impacts, limits, futures

Types of Activities: discussion, demonstration, surveys, projects, games, coloring books, simulations, role playing, experiments

Approaches: each notebook (1-3, 4-6, 7-9, 10-12) is organized into the six topic sections noted above; there is a matrix included to locate subject areas, recommended time and specific levels; activities are generally unsequenced and open-ended

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? varies with different activities at each level; references are suggested with each activity

Other/General Comments: this is a good, well-organized, comprehensive idea list; many of the activities have been suggested by teachers; teachers using it should also look at the volume below their grade level, for some fairly complex concepts are designated for introduction at lower levels

Title: Energy/Consumerism: Home Economics #09.014M665

Author: MN Dept. of Education **Issue Date:** 1975

Suggested Grade Levels: junior high and up

Suggested Subject Areas: home economics, consumer ed., any energy awareness unit

Media Types: folder with activities enclosed

Teacher Resource

Cost: free (loan)

Source: Minnesota Instructional Material Center (MIMC), 3554 White Bear Avenue, White Bear Lake, MN 55110

Energy Topics: use, waste, conservation

Types of Activities: survey, discussions, games, projects

Approaches: awareness and values clarification approaches

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? none required – some provided with different activities, teacher should feel comfortable leading values discussion

Other/General Comments: these activities could fit into a number of units dealing with energy/environment, as well as making up a unit in themselves

ENERGY MATERIALS EVALUATION

Title: Energy and Ecology: A Newsbook

Author: The Reading Laboratory **Issue Date:** 1976

Suggested Grade Levels: junior high and above

Suggested Subject Areas: interdisciplinary, reading, science, basic skills

Media Types: booklet with teacher guide leaflet

Teacher Resource; Student Material

Cost: $2.25

Source: The Reading Laboratory, Inc., 55 East Day Street, South Norwalk, Connecticut 06854

Energy Topics: sources, uses, future sources, protein, economy

Types of Activities: center on vocabulary, reading comprehension, writing skills, and discussion

Approaches: each topic starts with an informative article, followed by skills activities; as much emphasis is placed on reading and analyzing skills as on energy information

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none needed, each topic includes a glossary, some diagrams are included

Other/General Comments: this is good integration of energy topics with skills practice

Title: Energy Education in the Home: An Energy Education/Conservation Curriculum Guide for Home Economics Teachers

Author: U of Tennessee Environmental Center **Issue Date:** 1977
College of Home Economics

Suggested Grade Levels: junior high and up

Suggested Subject Areas: home ec., consumer ed.

Media Types: 324 page loose-leaf packet

Teacher Resource

Cost: $7.00

Source: ERDA Technical Information Center, P.O. Box 62, Oak Ridge, Tennessee 37830

Energy Topics: wise energy use and conservation in every phase of home life: cooking, clothes, shelter, etc.

Types of Activities: home survey, design problems, consumer comparison problems

Approaches: encourage awareness of and changes in lifestyle/energy consumption patterns

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? none required, much is given, extensive reference lists

Other/General Comments: despite recommending use of some questionable appliances (Trash compactors and garbage disposals), this is a good comprehensive background manual on different areas of consumption/conservation through home ec./family living courses

ENERGY MATERIALS EVALUATION

Title: Energy-Environment Mini-Unit Guide

Author: Stephen M. Smith **Issue Date:** 1975

Suggested Grade Levels: K – 12

Suggested Subject Areas: science, social studies

Media Types: book 220 pages

Teacher Resource

Cost: $3.00

Source: National Science Teachers Association, 1742 Connecticut Avenue N.W., Washington, D.C. 20009

Energy Topics: use, sources, transportation, heating, conservation, alternatives

Types of Activities: discussion, duplicated worksheets, games, some simple experiments

Approaches: each section includes background information, references, concepts, training strategies and activities

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? none, support materials, however, would be helpful, several reference lists included

Other/General Comments: other than a rather heavy emphasis on discussion, and very little "hands on" student experiments, this could be used as an idea list

Title: Energy, Food and You

Author: WA State Office of Public Instru. **Issue Date:** 1976

Suggested Grade Levels: 7 – 12

Suggested Subject Areas: all subjects

Media Types: 276 page book

Teacher Resource

Cost: $7.80

Source: Washington State Office of Public Instruction, #121 at Shoreline School Dist., NE 158 and 20 Avenue NE, Seattle, WA 98155

Energy Topics: global and individual food and energy use, marketing, land use, distribution, packaging, gardening

Types of Activities: discussion, experiments, demonstrations, lists, surveys, class and individual projects

Approaches: this collection is strongly oriented toward conservation; it explores many factors dealing directly and indirectly with food production and related energy topics; arranged by concept, cross indexed by subject

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? not much needed; quite a bit of information is supplied, along with extensive references and diagrams

Other/General Comments: this is an excellent, well arranged collection of activities; highly recommended

ENERGY MATERIALS EVALUATION

Title: Energy and Order

Author: Mark Terry/Paul Witt **Issue Date:** 1976

Suggested Grade Levels: senior high and up, others with modification

Suggested Subject Areas: physical science, possibly general biology, social studies

Media Types: 42 page book

Teacher Resource

Cost: $3.00

Source: Friends of the Earth Foundation, 529 Commercial St., San Francisco, CA 94111

Energy Topics: heat, energy conversion and transfer, simple thermodynamics principles, energy and food, nuclear power, U.S. lifestyle

Types of Activities: many good, simple experiments, suggested discussions and simulations; almost all have complete student participation, and are fairly fast moving

Approaches: combines experiments illustrating energy concepts with open-ended discussions, culminates with activities and discussions on values and choices, comparing U.S. lifestyle of consuming with other nations; emphasizes problems of nuclear power generation; environmental viewpoint

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? sections dealing with concepts/experiments in the phys. sciences probably require some minimum background; sections dealing with U.S. lifestyles and values don't need much; some background information is provided; many references cited in body of text and in separate bibliography

Other/General Comments: excellent supplement for a unit on energy, lifestyle, values, choices

Title: Energy & Society: Investigations in Decision Making

Author: Biological Sciences Curriculum Study **Issue Date:** 1976

Suggested Grade Levels: high school and up

Suggested Subject Areas: science, interdisciplinary

Media Types: teacher's manual, student booklets, slide set, illustration set, 8mm film loop, simulation game

Teacher Resource; Student Material

Cost: $85.00

Source: Hubbard Scientific, P.O. Box 104, Northbrook, Illinois 60062

Energy Topics: 1) physical laws; 2) politics; 3) environmental impact; 4) attitudes and feelings; 5) economics: public and private; 6) health and safety; 7) design and technology

Types of Activities: discussion, projects, community research and explorations, simulation game

Approaches: the unit is open-ended, emphasizing explorations of values and attitudes; it organizes around the seven general ideas noted under "topics"

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? suggestions are included for sources of more information; much information is given in the different components; material emphasizes open-ended format, with teacher learning with students

Other/General Comments: this is a comprehensive, well organized, interesting unit which could be used in many different major fields.

ENERGY MATERIALS EVALUATION

Title: The Energy We Use: Teacher Guide

Author: National Science Teachers Assn. **Issue Date:** 1976

Suggested Grade Levels: K – 12

Suggested Subject Areas: social studies, science, civics

Media Types: large loose-leaf packet, with spirit masters included

Teacher Resource

Cost: free

Source: National Science Teachers Association, 1742 Connecticut Avenue NW, Washington, D.C. 20009

Energy Topics: sources, nature of, lifestyle, agricultural use of energy, how a bill becomes a law

Types of Activities: discussion, some simple lab experiments and demonstration, simulations, research

Approaches: in general, the approach seems to be telling and demonstrating to the students

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? none, background information is provided with each activity

Other/General Comments: has some good ideas for introducing discussion topics; has more of a social studies than a science orientation

Title: Energy X

Author: Norman S. Warns, Jr. **Issue Date:** 1974

Suggested Grade Levels: high school and above

Suggested Subject Areas: social studies, economics, geography, science, values

Media Types: simulation game kit, filmstrip, cassette, worksheets, background sheets

Teacher Resource; Student Material

Cost: $19.50

Source: Ideal School Supply Co., Oak Lawn, Illinois 60453

Energy Topics: use, priorities

Types of Activities: simulation game in which students are asked to decide where to distribute a (mythical) source of energy, choosing three out of eight regions of the U.S.

Approaches: background information is given on each, region (manufacturing, agriculture, population, energy use, etc.); students chosen to represent each region explain which regions deserve new source; a student panel decides

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? none assumed; some back-up information on where different regions get their electric power is needed; teacher should be able to moderate intense values discussion

Other/General Comments: interesting simulation; no mention in background is made of lifestyles, but this could come up in discussion; teacher should read very carefully and decide what supplementary materials would be necessary to expand beyond the limited data game provides for student decision making.

ENERGY MATERIALS EVALUATION

Title: Experiments from Edison (series)

Author: Ronald Benray, Robert Schultz **Issue Date:** 1966-1976

Suggested Grade Levels: 5 – senior high (varies)

Suggested Subject Areas: physical sciences, industrial arts, some earth science

Media Types: 8 unsequenced pamphlets

Student Material

Cost: $3.50

Source: Thomas Alva Edison Foundation, Suite 143, Cambridge Office Plaza, 18280 W. Ten Mile Rd., Southfield, MI 48075

Energy Topics: building different circuits, simple experiments, environmental observations, nuclear energy

Types of Activities: simple lab experiments

Approaches: observation and experimentation with lots of simple activities

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? varies; for many, some basic familiarity with elementary physical sciences would help in setting up the labs

Other/General Comments: this is a very good series of experiment pamphlets; titles include: "Nuclear Experiments You Can Do", "Environmental Experiments", "Edison Inventions and Related Projects", "Electrical and Chemical Experiments", "Electrical Experiments You Can Do: From the Diary of Michael Faraday", "Edison Experiments", "How to Build Five Useful Electrical Devices", "Energy Conservation Experiments You Can Do"

Title: Heatloss

Author: MN Dept. of Education **Issue Date:** 1978

Suggested Grade Levels: junior high and up

Suggested Subject Areas: science

Media Types: 22 page book

Student Material

Cost: free

Source: Dept. of Education, Attn. Richard C. Clark, 550 Cedar Street, St. Paul, MN 55101

Energy Topics: home insulation, heatloss

Types of Activities: students assess their homes, step by step, for insulation and heat loss problems

Approaches: see activities. Information gathered by each student is fed into the MECC computer network, which then tells how each part of the house loses or conserves energy

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? not much

Other/General Comments: this is a good, step by step way of looking at a house to assess it and analyze problems; it's easy to use and has an attractive format

ENERGY MATERIALS EVALUATION

Title: Home Sweet Earth
Project Ecology

Author: Highline Public Schools **Issue Date:** 1975

Suggested Grade Levels: K – 3

Suggested Subject Areas: interdisciplinary

Media Types: short booklet

Teacher Resource

Cost: $2.50

Source: Project Ecology, Highline Public Schools, Dept. of Instruction, P.O. Box 66100, Seattle, WA 98166

Energy Topics: nature of energy, need for energy, the sun

Types of Activities: walks, discussions, art projects, simple experiments

Approaches: several activities are arranged around each of ten different concepts; activities are generally open-ended; ordered in a suggested sequence

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? none assumed; support materials are suggested in each lesson

Other/General Comments: these are good introductory ideas; about one third deal directly with energy topics

Title: Household Energy

Author: Ginn & Company **Issue Date:** 1976

Suggested Grade Levels: junior high and up

Suggested Subject Areas: phy. sciences, some activities also home economics

Media Types: 196 page booklet (check to see if teacher guide is available)

Student Material

Cost: $2.50

Source: Ginn & Company, P.O. Box 2649, Columbus, Ohio 43216

Energy Topics: use, conversion, measuring, in lab and home

Types of Activities: problems, lab experiments

Approaches: has a lot of consumer economics, how to decipher costs and make decisions

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? none, has good simple explanations and pictures

Other/General Comments: a very good source of activities dealing with elementary energy properties, measurements, etc.

ENERGY MATERIALS EVALUATION

Title: The Hydrocarbon Civilization

Author: MN Environmental Sciences Foundation **Issue Date:** 1975

Suggested Grade Levels: high school and up

Suggested Subject Areas: interdisciplinary (futures, social studies, science)

Media Types: folder of activities

Teacher Resource

Cost: $5.00

Source: Minnesota Environmental Sciences Foundation, 5400 Glenwood Avenue, Minneapolis, MN 55422

Energy Topics: sources, futures, attitudes, decision-making

Types of Activities: discussions, role-playing, attitude survey, predicting

Approaches: this packet of open-ended activities emphasizes decision-making, evaluation, and analysis processes

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? because the materials concentrate more on discussions and analyzing energy problems and futures, teacher would probably want background information on supply, demand, etc.

Other/General Comments: this set contains some good, thought-provoking activities

Title: Only Silly People Waste

Author: Norah Smaridge **Issue Date:** 1976

Suggested Grade Levels: K – 4

Suggested Subject Areas: general

Media Types: book

Student Material

Cost: $4.25

Source: Abingdon Press, 201 Eighth Avenue, Nashville, TN 37202

Energy Topics: energy waste

Types of Activities: none

Approaches: 14 humorous poems to be read aloud

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none

Other/General Comments: each poem tries to make its point by carrying waste of that commodity to ridiculous extremes, some poems good, some seem more to amuse adults, lots of drawings

ENERGY MATERIALS EVALUATION

Title: Interdisciplinary Student/Teacher Materials in Energy, The Environment and the Economy

Author: National Science Teachers Assn. **Issue Date:** 1977-78

Suggested Grade Levels: K – 12 (separate units) (see Other)

Suggested Subject Areas: science, social studies, math

Media Types: booklets

Teacher Resource

Cost: free

Source: U.S. Department of Energy, Technical Information Office, P.O. Box 62, Oak Ridge, Tennessee 37830

Energy Topics: transportation, energy use, energy policy, politics, conservation, energy conversion

Types of Activities: surveys, labs, discussion, role-playing

Approaches: materials are interdisciplinary

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? varies with the unit

Other/General Comments: the NSTA is putting out several interdisciplinary units on energy, by grade level; different units are available in different stages – some finished, some draft copies; write for information on what's currently available for your grade

Title: Science Activities in Energy

Author: Oak Ridge Associated Universities **Issue Date:** 1977

Suggested Grade Levels: 4th and up

Suggested Subject Areas: science

Media Types: four folders of activity sheets

Teacher Resource; Student Material

Cost: free

Source: American Museum of Atomic Energy, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37830

Energy Topics: four folders: Solar Energy, Conservation, Chemical Energy, Electrical Energy

Types of Activities: simple experiments

Approaches: open-ended explorations of the above topics

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? elementary level physical science, to explain the "why" of concepts encountered in experiments

Other/General Comments: very good set of activities, well designed and attractively presented; kids will have fun with the experiments; highly recommended; some experiments should be carefully supervised

ENERGY MATERIALS EVALUATION

Title: Physics: Energy in the Environment

Author: Alvin M. Saperstein **Issue Date:** 1975

Suggested Grade Levels: college

Suggested Subject Areas: physics, physical science

Media Types: 384 page text

Student Material

Cost: $9.95

Source: Little, Brown Publishing Co., 34 Beacon Street, Boston, MA 02106

Energy Topics: heat, thermodynamics, sources, limits, uses, food, waste, pollution, alternatives, conservation

Types of Activities: questions and problems at the end of chapters

Approaches: "straight science" with, in general, low level math

Student Outcomes: Clearly Stated? No **Areas:** Cognitive

What Teacher Background is Assumed? for teacher, some background in physical sciences; for student, little or no background, glossary and bibliography

Other/General Comments: good, coherent energy text

Title: Solar Energy Experiments for Secondary School Students

Author: Thomas W. Norton, et al **Issue Date:** 1977

Suggested Grade Levels: secondary, college

Suggested Subject Areas: physical sciences, industrial arts

Media Types: 130 page book

Teacher Resource; Student Material

Cost: $5.95

Source: Rodale Press, 33 E. Minor St., Emmaus, PA 18049

Energy Topics: solar energy experiments, energy use and demand, insulation and conductance

Types of Activities: experiments, problems, some discussions

Approaches: a brief introduction is given to different concepts and is immediately followed by a detailed experiment – many of which involve building things (collectors, boxes, etc.)

Student Outcomes: Clearly Stated? Yes

What Teacher Background is Assumed? teacher should have some physical sciences and math background

Other/General Comments: this has a good list of detailed experiments, showing principles of solar energy use

ENERGY MATERIALS EVALUATION

Title: Tilly's Catch A Sunbeam Coloring Book

Author: Tilly Spetgang **Issue Date:** 1975

Suggested Grade Levels: 1 – 6

Suggested Subject Areas: science, interdisciplinary

Media Types: coloring book

Student Material

Cost: $1.50

Source: Solar Service Corporation, 306 Cranford Road, Cherry Hill, New Jersey 08003

Energy Topics: elementary solar heating

Types of Activities: coloring book

Approaches: relating concepts to child's home environment

Student Outcomes: Clearly Stated? No **Areas:** Cognitive

What Teacher Background is Assumed? none needed

Other/General Comments: this is a very good, simple, brief look at solar energy; large print, good pictures to color

Title: Your Energy World

Author: Department of Energy **Issue Date:** 1978

Suggested Grade Levels: 5 – 8

Suggested Subject Areas: social studies, science

Media Types: 4 short packets of spirit masters, 1 poster, teacher's guide

Teacher Resource; Student Material

Cost: free

Source: Department of Energy, Technical Information Center, P.O. Box 62, Oak Ridge, Tennessee 37830

Energy Topics: conservation, transportation, waste, costs

Types of Activities: surveys, interviews, fill-in-the-blank, discussions

Approaches: units are organized to increase awareness of how much energy we use, and, assuming students become aware, strongly promote conservation

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? varies with activity; some demand on background; others assume basic physical science concepts; some need more numbers to back them up

Other/General Comments: the activities are wide-ranging and somewhat uneven in level; they do contain ideas worth reviewing

"A" LIST
BACKGROUND MATERIALS

ENERGY MATERIALS EVALUATION

Title: Chains, Webs, and Pyramids
Author: Lawrence Pringle and Jan Adkins **Issue Date:** 1975
Suggested Grade Levels: junior high and up
Suggested Subject Areas: life sciences
Media Types: 34 page book
Student Material
Cost: $5.50
Source: Thomas Y. Crowell Publishers, 666 Fifth Avenue, New York, NY 10019
Energy Topics: energy transfer in different food chains
Types of Activities: one
Approaches: basic background information
Student Outcomes: Clearly Stated? No
What Teacher Background is Assumed? none
Other/General Comments: this is an excellent background for life sciences

Title: The Coming Age of Solar Energy
Author: D. S. Halacy **Issue Date:** 1973
Suggested Grade Levels: senior high and above
Suggested Subject Areas: science, general interest
Media Types: 230 page book
General Information
Cost: $7.95
Source: Harper & Row, 10 East 53 Avenue, New York, NY 10022
Energy Topics: solar power, its history and its future
Types of Activities: none
Approaches: the book traces a long history of different solar projects, goes to current experiments and speculations – large and small; it proclaims solar as the energy of the future, and carries through this point of view
Student Outcomes: Clearly Stated? No
What Teacher Background is Assumed? none
Other/General Comments: fascinating compendium of solar lore

ENERGY MATERIALS EVALUATION

Title: Energy and Environment: Four Crises

Author: G. Tyler Miller **Issue Date:** 1975

Suggested Grade Levels: college, adult

Suggested Subject Areas: general background-current issues, sciences, values, social studies

Media Types: 122 page book

General Information

Cost: $4.50

Source: Wadsworth Publishing, 10 Davis Drive, Belmont, CA 94002

Energy Topics: sources, use, shortage, energy in biosphere, alternatives, nuclear dilemma, laws of thermodynamics, future, net energy concept

Types of Activities: discussion topics follow each chapter

Approaches: Miller examines the energy problem in terms of social systems and natural laws (of physics and biology); he details environmental costs of different energy generators and applies concepts of net energy in analyzing different systems and proposals

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? not much needed, but varies with different concepts; excellent, annotated chapter-end bibliography; many diagrams

Other/General Comments: the books takes about a third almost directly from Miller's earlier *Replenish the Earth;* it is a well written overview of the energy situation which can be recommended to a laymen; excellent

Title: Energy-Environment Source Book

Author: John M. Fowler **Issue Date:** 1975

Suggested Grade Levels: high school, adult

Suggested Subject Areas: science, general background, social studies

Media Types: 280 page book

General Information

Cost: $4.00

Source: National Science Teachers Association, 1742 Connecticut Avenue N.W., Washington, D.C. 20009

Energy Topics: supply, production, economics, conservation, policy, flow

Types of Activities: none

Approaches: background book – one in a series of NSTA energy publications; this one is divided into "Energy, Society, and the Environment," and "Energy, Its Extraction, Conversion and Use"

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none needed, provides many diagrams, glossary, math, primer and review

Other/General Comments: a good, general, background source

ENERGY MATERIALS EVALUATION

Title: Energy Glossary
Author: John Jones, et al **Issue Date:** 1977
Suggested Grade Levels: teacher use – all grades
Suggested Subject Areas: interdisciplinary
Media Types: booklet
Teacher Resource; General Information
Cost: $2.00
Source: Energy and Man's Environment, 0224 SW Hamilton, Suite 301, Portland, Oregon 97201
Energy Topics: glossary of energy terms
Types of Activities: none, but activity collections are also available from the above address
Approaches: comprehensive glossary
Student Outcomes: Clearly Stated? No
What Teacher Background is Assumed? none
Other/General Comments: this is a well done, handy reference

Title: Energy: A Glossary
Author: Thomas H. Maugh II **Issue Date:** 19
Suggested Grade Levels: senior high and up
Suggested Subject Areas: general
Media Types: spiral bound booklet, ten pages
General Information:
Cost: $1.00
Source: American Association for the Advancement of Science, 1515 Massachusetts Avenue N.W., Washington, D.C. 20036
Energy Topics: definitions of scientific terms dealing with energy
Types of Activities: none
Approaches: see topics
What Teacher Background is Assumed? none, is background
Other/General Comments: brief but handy listing

ENERGY MATERIALS EVALUATION

Title: Energy: Its Past, Its Present, Its Future
Author: Martin J. Gutnik **Issue Date:** 1975
Suggested Grade Levels: 4 – 7
Suggested Subject Areas: science
Media Types: hardbound book, 48 pages
Student Material
Cost: $4.95
Source: Childrens Press, Inc., 1224 W. Van Buren, Chicago, IL 60607
Energy Topics: energy sources, definition, uses
Types of Activities: none
Approaches: background information
Student Outcomes: Clearly Stated? No **Areas:** Cognitive
What Teacher Background is Assumed? none, diagrams and glossary included
Other/General Comments: a good, simple look at sources of energy

Title: Energy and Power
Author: Robert Irving **Issue Date:** 1958
Suggested Grade Levels: 6 and up
Suggested Subject Areas: science
Media Types: 140 page book
Student Material
Cost: $5.39
Source: Random House, 400 Hahn Road, Westminster, MD 21157
Energy Topics: types, sources, use
Types of Activities: none
Approaches: basic background information; chapter on nuclear power expresses optimism of 1950's, without citing problems
Student Outcomes: Clearly Stated? No
What Teacher Background is Assumed? none needed; this is an introductory level book; many diagrams are included
Other/General Comments: this has lots of clear examples kids can relate to; there may be some discrepancy between concepts and vocabulary levels; this is a good background book for a teacher to use with kids, however

Title: Energy: The Solar Prospect (World Watch Paper II)
Author: Dennis Hayes **Issue Date:** 1977
Suggested Grade Levels: high school and up
Suggested Subject Areas: science, Am. futures, general information
Media Types: 80 page booklet
General Information
Cost: $2.00
Source: Worldwatch Institute, 1776 Massachusetts Avenue N.W., Washington, D.C. 20036
Energy Topics: use, projected shortages, future options
Types of Activities: none
Approaches: this presents a coherent case for solar alternative energy development, including wind, photovoltaic cells, hydro, and biomass
Student Outcomes: Clearly Stated? No
What Teacher Background is Assumed? none; the footnotes provide an interesting bibliography
Other/General Comments: this is a cogent argument for the immediate development of solar alternative; it is well-written, fascinating reading

Title: Energy from the Sun
Author: Melvin Berger **Issue Date:** 1976
Suggested Grade Levels: 3 – 5
Suggested Subject Areas: science
Media Types: 33 page book
Student Material
Cost: $5.95
Source: Thomas Y. Crowell Publishers, 666 Fifth Avenue, New York, NY 10019
Energy Topics: sources, food types
Types of Activities: one simple experiment
Approaches: background information
Student Outcomes: Clearly Stated? No
What Teacher Background is Assumed? none needed
Other/General Comments: this is a very brief overview of some simple concepts about the sun's energy

ENERGY MATERIALS EVALUATION

Title: The Energy Trap

Author: D. S. Halacy, Jr. **Issue Date:** 1975

Suggested Grade Levels: 9 – above

Suggested Subject Areas: science, general background on energy

Media Types: 144 page book

Student Material

Cost: $6.95

Source: Four Winds Press, 916 Sylvan Avenue, Englewood Cliffs, NJ 07632

Energy Topics: use, supply, sources, shortage and causes, future

Types of Activities: none

Approaches: the book emphasizes the values and lifestyles of consumption which have led to the problem, as well as explaining the problem; promotes less energy intensive lifestyles

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none assumed; no bibliography

Other/General Comments: the book provides a good look at the overall energy problem, relating it to economics, values, and future projections

Title: Fact Sheets

Author: John M. Fowler/Kathryn Fowler **Issue Date:** 1977

Suggested Grade Levels: adult

Suggested Subject Areas: science, energy

Media Types: series of short pamphlets

General Information:

Cost: $1.00

Source: National Science Teacher's Association, 1742 Connecticut Avenue NW, Washington, D.C. 20009

Energy Topics: sources, alternatives, transportation, impact, reactor types, conservation

Types of Activities: none

Approaches: brief introduction to each topic, accompanied by statistics and bibliography; 19 different factsheets are available

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? varies; in general, little background is needed; these don't go into great depth, but do include bibliography and glossary

Other/General Comments: in general, these give good, brief introductions to different topics; order a complete set, for they refer to information on the different pamphlets in the series; they could be good supplements to an energy unit

ENERGY MATERIALS EVALUATION

Title: Harnessing the Sun: The Story of Solar Energy
Author: David C. Knight **Issue Date:** 1976
Suggested Grade Levels: 8 and up
Suggested Subject Areas: science
Media Types: 128 page book
Student Material
Cost: $5.95
Source: Morrow Jr. Books, 105 Madison Avenue, New York, NY 10016
Energy Topics: solar energy systems, how they work, efficiency, future
Types of Activities: none
Approaches: development of solar energy in past, principles of solar systems, makes future projections
Student Outcomes: Clearly Stated? No
What Teacher Background is Assumed? introductory level book, glossary included, many diagrams
Other/General Comments: a very good, clearly stated introduction to solar principles and possibilities

Title: Heat: A First Book
Author: Vicki Cobb **Issue Date:** 1973
Suggested Grade Levels: 6 – junior high
Suggested Subject Areas: science, physical science
Media Types: 60 page book
Student Material
Cost: $3.90
Source: Franklin Watts, Inc., 730 Fifth Avenue, New York, NY 10019
Energy Topics: heat, conversion, energy use
Types of Activities: some simple lab or kitchen experiments
Approaches: historical perspective of physics discoveries
Student Outcomes: Clearly Stated? No **Areas:** Cognitive
What Teacher Background is Assumed? none needed
Other/General Comments: good discussion of heat; perhaps some of the kitchen-type experiments would best be done under lab supervision

ENERGY MATERIALS EVALUATION

Title: Kilowatt Counter

Author: Gil Friend and David Morris **Issue Date:** 1974

Suggested Grade Levels: high school, adult

Suggested Subject Areas: energy (see below)

Media Types: 36 page pamphlet

General Information

Cost: $2.00

Source: Alternative Sources of Energy, Route 2, Box 90A, Milaca, MN 56353

Energy Topics: sources, conversion, use, alternatives, how to conserve, lifestyle

Types of Activities: none

Approaches: details problem and impact, from global to personal, of high energy consuming lifestyle

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none

Other/General Comments: good source of information; it sets out to establish a base for intelligent consumer decision making, and does a good job

Title: Nuclear Energy: Skeptic Issue #14

Author: several contributors **Issue Date:** August 1976

Suggested Grade Levels: high school and up

Suggested Subject Areas: social studies, science, American futures

Media Types: magazine

General Information

Cost: $1.50

Source: Skeptic Magazine, Inc., 812 Presidio Avenue, Santa Barbara, California 93101

Energy Topics: different viewpoints on nuclear energy

Types of Activities: none

Approaches: the magazine presents articles on nuclear power by some of the biggest names – pro and con – in the field

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none assumed; teachers should look over carefully to decide what supplementary information should be available for later discussion; this magazine will inevitably lead to intense value discussions

Other/General Comments: the articles tend to be short, well-written, and extremely thought provoking; excellent discussion starter; experts cited include Garret Hardin, Hans Bethe, Glenn Seaborg, Dixy Lee Ray, Ralph Nader, Theodore Taylor, Frank Zarb, and many others

ENERGY MATERIALS EVALUATION

Title: Push and Pull: The Story of Energy
Author: Paul E. Blackwood **Issue Date:** 1966
Suggested Grade Levels: junior high (good readers) and up (elementary – see "General")
Suggested Subject Areas: science
Media Types: 192 page hardback book
Student Material
Cost: $4.50
Source: McGraw-Hill Book Co., 1221 Avenue of Americas, New York, NY 10020
Energy Topics: types, physical laws, transfer, sources, alternatives
Types of Activities: some simple experiments
Approaches: intersperses simple experiments with background information
Student Outcomes: Clearly Stated? No
What Teacher Background is Assumed? none necessary
Other/General Comments: this is a good background book; the simple experiments could be used by teachers in energy or physical science units, many experiments would also be good for elementary

Title: Push! Pull! Stop! Go! A Book About Forces and Motion
Author: R. J. Lefkowitz **Issue Date:** 1975
Suggested Grade Levels: 4 – 6, concepts also junior high
Suggested Subject Areas: science
Media Types: 64 page book
Student Material
Cost: $4.59
Source: Parent's Magazine Press, 52 Vanderbilt Avenue, New York, NY 10017
Energy Topics: simple look at forces, inertia, gravity, momentum, friction
Types of Activities: none
Approaches: background book on topics noted above
Student Outcomes: Clearly Stated? No **Areas:** Cognitive
What Teacher Background is Assumed? none
Other/General Comments: good simple look at above topics

ENERGY MATERIALS EVALUATION

Title: The Sun
Author: Herbert S. Zim **Issue Date:** 1975
Suggested Grade Levels: 5 – junior high
Suggested Subject Areas: science
Media Types: book 65 pages
Student Material
Cost: $4.59
Source: William Morrow & Co., 105 Madison Avenue, New York, NY 10016
Energy Topics: sun's heat, size, surface, and energy
Types of Activities: a few simple experiments are suggested at the end
Approaches: background information
Student Outcomes: Clearly Stated? No **Areas:** Cognitive
What Teacher Background is Assumed? none needed; contains lots of pictures
Other/General Comments: very good, short, informative book on the sun

Title: Underground Furnaces: The Story of Geothermal Energy
Author: Irene Kiefer **Issue Date:** 1976
Suggested Grade Levels: junior high and up
Suggested Subject Areas: science
Media Types: 64 page book
Student Material
Cost: $4.95
Source: Morrow Junior Books, 105 Madison Avenue, New York, NY 10016
Energy Topics: definition and explanation of geothermal energy sources, and projections of its future role
Types of Activities: none
Approaches: background information
Student Outcomes: Clearly Stated: No
What Teacher Background is Assumed? none needed; the book contains many diagrams, plus a glossary
Other/General Comments: the book gives a good, brief introduction to geothermal energy

ENERGY MATERIALS EVALUATION

Title: Why Things Work: A Book About Energy

Author: Jeanne Bendick **Issue Date:** 1972

Suggested Grade Levels: 3 – 6

Suggested Subject Areas: science

Media Types: 64 page book

Student Material

Cost: $4.96

Source: Parents' Magazine Press, 52 Vanderbilt Avenue, New York, NY 10017

Energy Topics: definition, conversion, sources, flow from usable to non-usable form

Types of Activities: none

Approaches: background information

Student Outcomes: Clearly Stated? No **Areas:** Cognitive

What Teacher Background is Assumed? none needed

Other/General Comments: this is a good basic book though it treats some extremely complex ideas rather briefly

"B" LIST
ACTIVITIES

ENERGY MATERIALS EVALUATION

Title: Deciding How to Live on Spaceship Earth

Author: Daniel M. Ulrich, Steven Woolard, Rodney F. Allen, Carmelo Foti **Issue Date:** 1975

Suggested Grade Levels: junior and senior high school

Suggested Subject Areas: civics, social studies, American values, interdisciplinary

Media Types: 134 page book

Teacher Resource

Cost: $4.76

Source: Values Education Series, McDougal, Littell & Co., Box 1667, Evanston, IL

Energy Topics: use, conservation, lifestyle choices

Types of Activities: discussion, listing, some research, simulations

Approaches: the book has seven sections of values "dilemmas" organized around different environmental problems; the section on energy, like the others, contains open-ended activities, many of which are of the "pollution vs. jobs" role playing type

Student Outcomes: Clearly Stated? No **Areas:** Cognitive some; Affective

What Teacher Background is Assumed? teacher must be competent in moderating values discussions; some information is provided at the beginning of each section, but teacher would probably want to gather much more before starting unit

Other/General Comments: several of the dilemmas either don't give enough information for decision making, or give only enough to promote a very simplistic solution; in general, however, many of the scenarios would be useful and enjoyable to challenge students, with more background information essential

Title: Energy Activities

Author: Natural Gas Council **Issue Date:** 1977

Suggested Grade Levels: 4 – 12 depending on activity

Suggested Subject Areas: science

Media Types: packet of activities

Teacher Resource

Cost: free

Source: Natural Gas Council, 1705 Soo Line Building, Minneapolis, Minnesota 55402

Energy Topics: use, waste, conservation, transfer, solar

Types of Activities: games, experiments

Approaches: unsequenced activities presented with very little background information

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? varies widely with activity

Other/General Comments: some of these activities might work with an energy unit the teacher has already set up; it's difficult to identify appropriate levels for some of the activities

ENERGY MATERIALS EVALUATION

Title: Energy Activities with Energy Ant

Author: Federal Energy Administration **Issue Date:** 1975

Suggested Grade Levels: second or third with vocabulary help, 4th

Suggested Subject Areas: general interest

Media Types: 28 pg. coloring book

Student Material

Cost: free (limited)

Source: Federal Energy Administration, 175 W. Jackson, Chicago, Illinois 60604

Energy Topics: short background on energy use, some low level instructions about specific conservation measures

Types of Activities: directed, fill-in-the-blank type, a few puzzles, riddles, maze, rummy-type card game

Approaches: activities directed, not open-ended, no sequence, "you should" approach

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none assumed

Other/General Comments: If kids are really excited about coloring books, this may give them some information. Concepts are okay for lower primary, vocabulary probably intermediate. Puzzles rather than energy seem to be main point of booklet

Title: The Energy Book

Author: S. Carolina Dept. of Education **Issue Date:** 1975

Suggested Grade Levels: K – 12

Suggested Subject Areas: social, language, science, art, math, phy. ed.

Media Types: 30 page book

Teacher Resource

Cost: $1.50

Source: S. Carolina Dept. of Education

Energy Topics: sources, use, heat, conversion, conservation, lifestyles

Types of Activities: listing, research, predicting, discussions, a few simple projects, simulations

Approaches: activities are generally open-ended, keyed to different subject areas, and divided further into individual and small group activities; the newspaper is also recommended as a resource, with several activities suggested

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? teacher would want materials to supplement these activities; no background is given in book; bibliography is included

Other/General Comments: in general, a list of which might contain some activities to supplement a unit on energy

ENERGY MATERIALS EVALUATION

Title: The Energy Crisis: What You Can Do About It?

Author: Standard Oil **Issue Date:**

Suggested Grade Levels: 3 – 7

Suggested Subject Areas: science

Media Types: 4 spirit masters and brief teacher's guide

Teacher Resource; Student Material

Cost: free

Source: Standard Oil Co., Director of Youth and Educational Activities, Mail Code 3705, 200 East Randolph Drive, Chicago, IL 60601

Energy Topics: sources, use, products from oil, cost

Types of Activities: survey, discussion, demonstration, checklist

Approaches: this gives a general background on some aspects of energy use; approach is fairly objective, informative

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none needed

Other/General Comments: this could be a useful supplement to an energy unit

Title: Energy & Ecology – Are You Involved

Author: Youth Education, Inc. **Issue Date:** 1974

Suggested Grade Levels: secondary

Suggested Subject Areas: social studies

Media Types: 50 spirit masters in booklet form

Student Material

Cost: $6.95

Source: Learning Realities Inc., 10 East 40 Street, New York, NY 10016

Energy Topics: sources, use, crisis, conflicts of interest, alternative sources, government and energy

Types of Activities: many dittos are fill-in-the-blank, many suggest discussions, several have games and role playing, research, several on values

Approach: the 50 spirit masters combine background information with activities; the producer suggests they be passed out in sections in workbook form; may be slight bias toward nuclear power

Student Outcomes: Clearly Stated? No **Areas:** Cognitive; Affective

What Teacher Background is Assumed? a teacher using these would probably want more support materials in the classroom; no technical background is necessary; short bibliography included.

Other/General Comments: there is one probable inaccuracy regarding span of nuclear waste hazard: they cite 900 years rather than 250,000 years, the most common figure. The dittoes could also be used to supplement an energy unit. They include many good activities.

ENERGY MATERIALS EVALUATION

Title: Energy Futures

Author: Donald Parr **Issue Date:** 1976

Suggested Grade Levels: junior high

Suggested Subject Areas: science

Media Types: short booklet

Teacher Resource

Cost: $2.50

Source: Highline Public Schools, Project Ecology, P.O. Box 66100, Seattle, Washington 98166

Energy Topics: use, types, transfer, conservation, futures

Types of Activities: lab experiments, surveys, math, meter reading, discussions, library research

Approaches: this does a nice job of interspersing experiments and projects with discussion of concepts about the nature of energy and man's use of energy

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? a junior high school science teaching background is assumed for setting up some experiments and answering anticipated questions

Other/General Comments: this is a good booklet, hampered slightly by being only part of a materials pack from the above-noted schools; most of the classroom equipment r oted, however, is easily available; though some discussions are specific to Washington, this is well worth looking over

Title: Energy & Man's Environment — Activity Guide

Author: Thomas Ris **Issue Date:** 1973

Suggested Grade Levels: K — 12

Suggested Subject Areas: interdisciplinary, science, social studies, home ec., art

Media Types: 112 page book

Teacher Resource

Cost: $20.00

Source: Education/Research Systems, Inc., 3121 Fifth Avenue, Seattle, WA 98121

Energy Topics: uses, sources, conversion, environmental costs, limits of the earth, future sources

Types of Activities: discussion, exploration, surveys, experiments, projects, research

Approaches: the book is arranged around 6 topics, with scientific, ethical, aesthetic, and utilitarian objectives identified for each; activities keyed to each grade for each category of objectives also accompany each topic

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? some of the experiments for junior and senior high assume lab skills on teacher's part; otherwise, the background assumed varies, support materials would be recommended throughout; glossary and bibliography included

Other/General Comments: this is good sourcebook of activities — well arranged by concept and objectives, and easy to use

ENERGY MATERIALS EVALUATION

Title: Energy and Man's Environment: Activity Guide (7 parts)

Author: John Jones, Editor **Issue Date:** 1976

Suggested Grade Levels: upper elementary to senior high and up

Suggested Subject Areas: science, social studies, language, see below

Media Types: 7 booklets

Teacher Resource

Cost: $16.00

Source: Energy & Man's Environment, 0224 SW Hamilton, Portland, OR 97201

Energy Topics: sources, uses, conversion, impacts, limits, future and activity guide

Types of Activities: research, discussion, simulation, some projects and simple experiments

Approaches: activities list, many activities demand fairly sophisticated research skills, many are suggested field trips

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive; Affective

What Teacher Background is Assumed? depending on the specific activity, quite a bit of background may be assumed; no bibliography or glossary; minimum background information provided

Other/General Comments: this is a "brainstorming" type list of energy activities, containing everything from simple, no-equipment, no-background types, to activities showing organic chemistry structures and suggesting extensive library research, or asking student to find figures not easily available

Title: Energy: Science World Visuals 3

Author: Dr. Theodore Benjamin/Carl Proujan **Issue Date:** 1974

Suggested Grade Levels: high school

Suggested Subject Areas: physical sciences, industrial arts

Media Types: 8 sets of paired transparencies, 8 spirit masters, brief teacher's guide

Teacher Resource; Student Material

Cost: $13.50

Source: Scholastic Book Services, 916 Sylvan Avenue, Englewood Cliffs, NJ 07632

Energy Topics: inertia, energy conversions, solar energy, friction burning

Types of Activities: problem solving – math and logic

Approaches: the top transparency (and corresponding spirit master) in each set poses a problem; the second transparency overlay has the solution; further questions are suggested in teacher's guide

Student Outcomes: Clearly Stated? No **Areas:** Cognitive

What Teacher Background is Assumed? some background is given with each problem, but they do assume background knowledge on most topics

Other/General Comments: they look like good additions to different units; solving the problems demands, some understanding of the concepts, rather than just simple math

ENERGY MATERIALS EVALUATION

Title: Energy, Structure, Life

Author: Louis W. Bixby, Edson Mitchell, William Scoft **Issue Date:** 1965

Suggested Grade Levels: high school or college

Suggested Subject Areas: physical science (see below)

Media Types: two books, 540 pages

Student Material

Cost: $26.00

Source: St. Louis County Day School, 425 N. Warson Road, St. Louis, MO 63124

Energy Topics: physics and chemistry of energy transactions in living and non-living situations

Types of Activities: lab activities, problems

Approaches: these books combine chemistry and physics into one integrated course; the course is lab/math oriented; the second part gets into biochemistry

Student Outcomes: Clearly Stated? No **Areas:** Cognitive

What Teacher Background is Assumed? physical science background, biology background

Other/General Comments: these books represent an attempt to unify the basics of physics, chemistry, and biology into a sequence

Title: Environmental Impact of Electrical Generation: Nuclear and Fossil

Author: Pennsylvania Dept. of Education **Issue Date:** 1975

Suggested Grade Levels: high school and up (probably an honors course in high school)

Suggested Subject Areas: physical sciences, perhaps social studies (below)

Media Types: paperback student text and teacher's guide

Teacher Resource; Student Material

Cost: $4.25/set

Source: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

Energy Topics: demand, types of electric generating plants, problems, health risks, plant siting, environment, conservation

Types of Activities: discussion, some class experiments, library research projects

Approaches: a short introductory chapter on each topic is followed by much background material — most of it from government agencies; there appears to be a pro-nuclear leaning

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? some background in physical sciences required; much of the supplementary material is somewhat technical, and graphs and diagrams are not always clearly explained

Other/General Comments: this is a comprehensive unit, with much interesting background information; a teacher might want to introduce other points of view on safety hazards and acceptability of health risks from different types of plants; there is a short values and decision-making component built in; probably too difficult for average high school class

ENERGY MATERIALS EVALUATION

Title: The Household Energy Game

Author: Thomas W. Smith/John Jenkins **Issue Date:** 1974

Suggested Grade Levels: junior high and up

Suggested Subject Areas: general, home economics/consumer education

Media Types: 20 page pamphlet

General Information

Cost: $.10

Source: Sea Grant Communication Office, 1800 University Avenue, Madison, WS 53706

Energy Topics: energy use and conservation in the home

Types of Activities: making up an energy budget and improving it

Approaches: game-board type grid is laid out to help estimate amounts of energy used; some background information is given

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none

Other/General Comments: simply a step-by-step look at where families use energy; could be a useful tool

Title: Ideas and Activities for Teaching Energy Conservation

Author: U of Tennessee Environment Center **Issue Date:** 1977

Suggested Grade Levels: 7 – 12

Suggested Subject Areas: social studies, science, language arts, interdisciplinary

Media Types: 225 page booklet

Teacher Resource

Cost: free

Source: Tennessee Energy Office, Suite 250 Capitol Hill, Nashville, Tennessee 37219

Energy Topics: conservation, use, sources

Types of Activities: library research, discussion, surveys, field trips, class projects

Approaches: the different activities each center on a concept followed by a brief explanation; activities, in general, are just lists of questions for students to look up and discuss, promotes conservation ethic and lifestyle change

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? varies with activity; an introductory background section with references is provided

Other/General Comments: the background sections are good; the separation into different concepts is good, the bibliography is very good, but the activities are too similar in format (discuss, research) for all disciplines

ENERGY MATERIALS EVALUATION

Title: Living with Energy

Author: Standard Oil Co. (Indiana) **Issue Date:** 1974

Suggested Grade Levels: high school and up

Suggested Subject Areas: social studies, science, American values

Media Types: five spirit masters, teacher's guide

Teacher Resource; Student Material

Cost: free (1 set)

Source: Director, Youth and Educational Activities, Standard Oil Co. (Indiana), Mail Code 3705, 200 E. Randolph Drive, Chicago, IL 60601

Energy Topics: use, supply, sources

Types of Activities: discussion, lists, interviews, simulation game

Approaches: open-ended discussions are encouraged, interspersed with a few facts and figures on energy use

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? because this is a very short packet, a teacher would probably need additional material

Other/General Comments: this could be a useful supplement to an energy unit; a film by the same title is available from Modern Talking Pictures; this packet, however, can be used without it

Title: Nuclear Science

Author: Pennsylvania Dept. of Education **Issue Date:** 1977

Suggested Grade Levels: advanced senior high students and up

Suggested Subject Areas: physical sciences

Media Types: 120 page booklet

Teacher Resource

Cost: free

Source: Dept. of Education, Box 911, Harrisburg, PA 17126

Energy Topics: health physics, nuclear theory, nuclear plants

Types of Activities: experiments, demonstrations, discussions

Approaches: this is an intensive course, emphasizing lecture and experimentally verified information about nuclear science

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? teacher would need a good background in physical sciences and nuclear theory, plus ability to set up and supervise a number of nuclear science experiments; there is a reference list

Other/General Comments: though this course is supposedly designed for high school, it would be most suited to some sort of honors group or seminar; little background information is included in the booklet

ENERGY MATERIALS EVALUATION

Title: Power (one of seven units in Urban Environmental Studies)

Author: Mpls. Public Schools **Issue Date:** 1978

Suggested Grade Levels: middle elementary

Suggested Subject Areas: interdisciplinary – has some science, some math, social studies, language arts

Media Types: ring bound booklet flipcards, teacher's guide

Teacher Resource; Student Material

Cost: $27 (whole set only)

Source: Mpls. Public Schools, 807 NE Broadway, Minneapolis, MN 55413

Energy Topics: types of "power" (water, political, health knowledge, group, etc.), transportation, others through different units

Types of Activities: listing, exploring, discussing, art; most activities are unsequenced, and divided into "investigating," "celebrating", and "acting" activities

Approaches: materials are open-ended and developed around a values clarification format; there is chart in the teacher's guide indicating which activities are in what subject areas; subthemes are identified, as are recommended activity sequences for the sub-themes

Student Outcomes: Clearly Stated? No **Areas:** Cognitive; Affective

What Teacher Background is Assumed? not much on content but an ability to lead value-clarification exercises is necessary; some value-clarification information is given in the teacher's guide

Other/General Comments: these materials have many activities dealing with environmental education and lifestyle; they explore all sorts of "power" in the everyday wide use of the term; several of the activities could be adapted for use in a more structured unit specifically on energy; this is only one of seven Urban Environmental Studies Units

Title: Priority One: Environment: The Energy Challenge Activity Cards

Author: Pollution Control Education Center

Suggested Grade Levels: 7 – 12

Suggested Subject Areas: science

Media Types: set of 12 activity cards

Student Material

Cost: $2.50

Source: Pollution Control Education Center, Union Public Schools, Union, New Jersey 07083

Energy Topics: use, transformation, efficiency, experiments

Types of Activities: math in household energy computations, simple lab experiments

Approaches: these cards give very brief background and then detail student experiments or problems

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? experience in supervising junior high science labs; a teacher would also want supplementary information

Other/General Comments: these activity cards would make a very good addition to an energy unit; there are a few inaccuracies in background information

ENERGY MATERIALS EVALUATION

Title: Science 5/13

Author: Nuffield Foundation **Issue Date:** 1972

Suggested Grade Levels: K – 12

Suggested Subject Areas: science

Media Types: series of booklets

Teacher Resource

Cost: $46.55 for entire series
$6.95 average/book

Source: Macdonald-Raintree, Inc., 205 West Highland Avenue, Milwaukee, WS 53203

Energy Topics: conversion, forms, sources, gravity, heat, inertia, change, chains

Types of Activities: experiments, projects, demonstrations, discussion

Approaches: this series is based on Piaget's concepts of learning stages, the activities are, in general, discovery oriented, hands-on, simple-materials experiments

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? in general, not much, though this varies with the activities

Other/General Comments: this is a very good series; seven of the booklets were reviewed, including With Objectives in Mind, Science, Models and Toys (1 and 2), Change (1 and 2), and Structures and Forces (1 and 2); some of the activities are hard to isolate from the longer sequences proposed in the texts

Title: The Student Scientist Explores Energy and Fuels

Author: William Kaplan and Melvyn Lebowitz **Issue Date:** 1976

Suggested Grade Levels: high school

Suggested Subject Areas: physics, industrial arts

Media Types: 137 page book

Student Material

Cost: $4.80

Source: Richard Rosen Press, 29 East 21 Street, New York, NY 10010

Energy Topics: need, nature of energy, sources, alternatives, environment, crisis

Types of Activities: simple lab experiments, problems, discussions, questions

Approaches: explanation of chemistry and physics of energy production; mentions problems of nuclear, but is optimistic, mentions conservation and lifestyle briefly in last two pages

Student Outcomes: Clearly Stated? No **Areas:** Cognitive

What Teacher Background is Assumed? no special background beyond that which teachers in physical science would have

Other/General Comments: has good, fairly clear explanation of mechanics of energy reactions, transfer and production

ENERGY MATERIALS EVALUATION

Title: What's the Matter with Energy?

Author: Educational Research Council of America **Issue Date:** 1973

Suggested Grade Levels: high school

Suggested Subject Areas: chemistry, physics, physical science, biology

Media Types: student book and teacher guide

Teacher Resource; Student Material

Cost: $1.92/teacher guide
$1.67/student book

Source: Educational Research Council of America, Rockefeller Building, 614 West Superior, Cleveland, Ohio 44113

Energy Topics: measuring energy, kinds of energy and conversions, calculating efficiency of a system

Types of Activities: lab experiments, math problems, some discussion questions

Approaches: lab discovery, directed

Student Outcomes: Clearly Stated? Yes **Areas:** Cognitive

What Teacher Background is Assumed? teacher's guide gives supplementary information, some background in physical sciences assumed, to run labs with batteries, calorimeters, etc.

Other/General Comments: these activities would plug in well to units dealing with energy conversions, efficiency, etc.

"B" LIST
BACKGROUND MATERIALS

51

Title: Alternative Sources of Energy

Author: Sandy Eccli (ed.) **Issue Date:** 1975

Suggested Grade Levels: teacher or high school resource book

Suggested Subject Areas: sciences, social studies, language, values

Media Types: 280 page catalogue-type book

General Information

Cost: $7.95

Source: Seabury Press, 815 Second Avenue, New York, NY 10017

Energy Topics: alternative energy sources, politics of energy, poetry, conservation

Types of Activities: none suggested as such – contains information on building or refining some back-yard type energy systems

Approaches: mixed bag of information, opinion, poetry, counter-culture articles and references

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? varies with different articles, extensive bibliography on energy and power, solar energy, wind, water, agriculture and organic fuels, energy storage, energy conversion devices, direct energy conversion, architecture and the arts

Other/General Comments: source book in style and basic format of the *Whole Earth Catalogue*

Title: America's Oil Famine: How It Happened and When It Will End

Author: Ruth Sheldon Knowles **Issue Date:** 1975

Suggested Grade Levels: high school and above

Suggested Subject Areas: general background, social, world politics, government

Media Types: 254 page book

General Information

Cost: $8.95

Source: Coward, McCann & Geoghegan, Inc., 200 Madison Avenue, New York, NY 10016

Energy Topics: development (political and historical) of the oil shortage

Types of Activities: none

Approaches: an articulate book by a spokeswoman for the oil industry; she blames environmentalists for irrational delay in developing energy resources; does make a strong case for conservation

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none required

Other/General Comments: well written, oil industry point of view on causes and cures of energy crisis

ENERGY MATERIALS EVALUATION

Title: Beyond the Energy Crisis: A Global Perspective

Author: John Maddox **Issue Date:** 1975

Suggested Grade Levels: college and adult

Suggested Subject Areas: general background, economics

Media Types: 208 page book

General Information

Cost: $8.95

Source: McGraw Hill, 1221 Avenue of Americas, New York, NY 10020

Energy Topics: history of crisis, economics thereof, future solutions

Types of Activities: none

Approaches: author concentrates on economics of energy situations, including OPEC manipulation; he sees conservation as a red herring, and places his faith for the future in nuclear power

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? short bibliography, none

Other/General Comments: makes interesting reading on applying economic analysis to energy market; as noted above, Maddox is supporting a "technology can solve it all" point of view

Title: Black Gold: The Story of Oil

Author: W. E. Butterworth **Issue Date:** 1975

Suggested Grade Levels: 8 – senior high

Suggested Subject Areas: general information

Media Types: 224 page book

Student Material

Cost: $6.95

Source: Four Winds Press, New York

Energy Topics: history of oil, especially twentieth century politics

Types of Activities: none

Approaches: historical

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none

Other/General Comments: interesting, readable account, with lots of humanizing detail

ENERGY MATERIALS EVALUATION

Title: Black Mesa: The Angel of Death

Author: Suzanne Gordon **Issue Date:** 1973

Suggested Grade Levels: adult

Suggested Subject Areas: social studies

Media Types: 113 page book

General Information

Cost: $4.95

Source: John Day Co., Inc., 666 Fifth Avenue, New York, NY 10019

Energy Topics: the mining of Black Mesa, Airzona, for coal for power plants, and resultant destruction and pollution

Types of Activities: none

Approaches: this takes the point of view of the Indians, who claim Peabody Coal maneuvered illegally into coal leases on sacred ground; has lots of pictures

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none needed

Other/General Comments: strongly worded indictment of power company action in Southwest

Title: Energy

Author: Irving Adler **Issue Date:** 1970

Suggested Grade Levels: 6 and up

Suggested Subject Areas: science

Media Types: 48 page book

Student Material

Cost: $5.50

Source: The John Day Company, 666 Fifth Avenue, New York, NY 10019

Energy Topics: definitions (physical science), types, uses, food

Types of Activities: none

Approaches: provides background information in an overview of basic physical science topics

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none needed but more amplification of some subjects might help the students

Other/General Comments: this is a fairly straightforward physical science book; conservation is not mentioned

ENERGY MATERIALS EVALUATION

Title: Energy

Author: Gerald M. Crawley **Issue Date:** 1975

Suggested Grade Levels: college

Suggested Subject Areas: physical science, special energy course

Media Types: 337 page textbook

Student Material

Cost: $10.95

Source: MacMillian Education Corp., 866 Third Avenue, New York, NY 10022

Energy Topics: standard physics text treatment of energy, tied in with use, alternate sources, economics, politics

Types of Activities: discussion, problems, research, questions at end of each chapter

Approaches: energy is an organizing theme for excursions into physics, different social sciences, and lifestyle

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? for teachers, a standard physical science background; for student, not much background (some math) required

Other/General Comments: goes from standard, physical science concepts to discussions of elementary economics and its relation to energy; touches many topics

Title: The Energy Balloon

Author: Stewart Udall, et al **Issue Date:** 1976

Suggested Grade Levels: high school and up

Suggested Subject Areas: general background

Media Types: 288 page book

General Information

Cost: $7.95

Source: McGraw Hill, 1221 Avenue of Americas, New York, NY 10020

Energy Topics: use, over use, resultant problems, lifestyle solutions, sources

Types of Activities: none

Approaches: strong environmentalist point of view; analyzes history of energy use/overuse in U.S.; proposes alternatives, lifestyle changes

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none, brief bibliography, no index provided

Other/General Comments: though several good creative solutions to different problems are offered, the mechanics (political, economic) of implementing them are not; the book is a highly readable account of an environmentalist's view of future lifestyles

ENERGY MATERIALS EVALUATION

Title: Energy Conservation: An Overview

Author: American Petroleum Institute **Issue Date:** 1977

Suggested Grade Levels: varies, reading material 6 – 9

Suggested Subject Areas: geography, science

Media Types: folder of pamphlets, booklets, resource lists, charts

Teacher Resource; Student Material; General Information

Cost: free

Source: American Petroleum Institute, 2101 L Street N.W., Washington, D.C. 20037

Energy Topics: history of oil, conservation

Types of Activities: booklet of problems and simple experiments, conservation check list

Approaches: information and industry point of view

Student Outcomes: Clearly Stated? No **Areas:** Cognitive

What Teacher Background is Assumed? none assumed, teacher might want to have other materials available

Other/General Comments: contains miscellaneous information on oil and energy, lots of statistics, listing of free-loan oil company films, and one excellent booklet of hands-on experiments from Edison

Title: Energy Crisis: Danger and Opportunity

Author: Victor John Yannacone, Jr. **Issue Date:** 1974

Suggested Grade Levels: college and adult

Suggested Subject Areas: general background

Media Types: 432 page book

General Information

Cost: $5.95

Source: West Publishing Co., 50 W. Kellogg Blvd., St. Paul, MN 55102

Energy Topics: resources, environmental aspects, nuclear, hazards, conservation, cost-benefits of different types, how different systems work

Types of Activities: none

Approaches: compedium of long, in-depth articles on above topics by experts in the field

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? varies with different articles; none, in general, some references

Other/General Comments: quite a bit of information, background section on different authors is provided to help identify points of view

ENERGY MATERIALS EVALUATION

Title: The Energy Crisis

Author: Tad Szulc **Issue Date:** 1974

Suggested Grade Levels: high school and up

Suggested Subject Areas: economics, world history and government, social studies

Media Types: book, 135 pages

General Information

Cost: $6.95

Source: Franklin Watts Publishing, 730 Fifth Avenue, New York, NY 10019

Energy Topics: history of the oil embargo of 1973, starting in the 1930's

Types of Activities: none

Approaches: shows the politics and alliances of the major oil companies leading up to the embargo, and oil companies (and OPEC's) roles in international government dealings

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none, very short bibliography

Other/General Comments: well written, fast-moving historical background; consumer advocate point of view

Title: Energy, Earth and Everyone: A Global Strategy for Spaceship Earth

Author: Medard Gabel **Issue Date:** 1975

Suggested Grade Levels: adult

Suggested Subject Areas: science, social studies, general interest

Media Types: 160 page book

General Information

Cost: $4.95

Source: Straight Arrow Books, 625 Third Street, San Francisco, California 94107

Energy Topics: sources, use, conservation, future sources

Types of Activities: none

Approaches: a world game workshop analyzed the world energy situation and tried to come up with a global strategy for energy development

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? varies; alternative sources and their mechanics are presented (with diagrams) quite briefly; good references, glossary

Other/General Comments: a schematic, systems and process approach to the problem, endorsed by Buckminster Fuller; it comes up with an interesting global strategy and timetable, but is sketchy on political problems of implementing same

ENERGY MATERIALS EVALUATION

Title: Energy Education Bibliography and Films Index
Author: John Jones, et al **Issue Date:** 1977
Suggested Grade Levels: teacher use – all grades
Suggested Subject Areas: interdisciplinary
Media Types: two booklets, available separately
Teacher Resource
Cost: $2.00/booklet
Source: Energy and Man's Environment, 0224 SW Hamilton, Suite 301, Portland, Oregon 97201
Energy Topics: reference materials available on different energy topics
Types of Activities: none, but activity collections are also available from the above address
Approaches: the lists are annotated, listing also grade levels and topics
Student Outcomes: Clearly Stated? No
What Teacher Background is Assumed? none
Other/General Comments: these are two of a number of publications put out by EME

Title: Energy in the World of the Future
Author: Hal Hellman **Issue Date:** 1973
Suggested Grade Levels: high school and up
Suggested Subject Areas: science, general background
Media Types: book 240 pages
General Information
Cost: $6.95
Source: M. Evans & Co., Inc., 216 East 49 Street, New York, NY 10017
Energy Topics: sources, conversions, how different methods work, possible future alternatives
Types of Activities: none
Approaches: discusses different energy sources and plants and gives low level technical explanation of how different ones work; pro-nuclear conclusion – but not necessarily fast-breeder reactor
Student Outcomes: Clearly Stated? No
What Teacher Background is Assumed? none necessary; bibliography included; lots of good diagrams
Other/General Comments: contains good, simple explanations of how things work

ENERGY MATERIALS EVALUATION

Title: Energy and the Future

Author: Milton A. Rothman **Issue Date:** 1975

Suggested Grade Levels: 6 and up

Suggested Subject Areas: physical science, general background

Media Types: 114 page book

Student Material

Cost: $6.95

Source: Franklin Watts Publishing, 845 Third Avenue, New York, NY 10022

Energy Topics: use, sources, conversion, alternatives

Types of Activities: none

Approaches: background information on above topics at an elementary level

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none, some diagrams, glossary

Other/General Comments: the information is well-presented, but there may be some discrepancy between reading level and concept level

Title: Energy Education: An Overview and Resource Guide

Author: Mankato State University

Suggested Grade Levels: teachers

Suggested Subject Areas: energy background

Media Types: 43 page spiral bound book

Teacher Resource; General Information

Cost: $1.00

Source: Dr. Iver H. Johnson, Mankato State University, Mankato, MN 56001

Energy Topics: sources of energy and their characteristics

Types of Activities: none

Approaches: 3-dimensional matrix system, keying forms of energy to conceptual focus (knowledge, assessment) and energy study parameters (nature of, processing, transmission, storage, utilization)

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? this is background material, a very brief background information section is given on each form; also includes glossary and bibliography; much supplementary material needed for unit

Other/General Comments: a good outline, as far as it goes; leans heavily toward listing, rather than explanations of how things work

ENERGY MATERIALS EVALUATION

Title: Energy: Resource, Slave, Pollutant: A Physical Science Text
Author: Robert S. Rouse, Robert O. Smith **Issue Date:** 1975
Suggested Grade Levels: college
Suggested Subject Areas: physical science (non-major)
Media Types: 520 page text
Student Material
Cost: $12.95
Source: MacMillan Publishing, 866 Third Avenue, New York, NY 10022
Energy Topics: nature, sources, consumption, limits, consequences
Types of Activities: problems, discussions after each chapter
Approaches: college text organizing various physical science concepts around theme of energy
Student Outcomes: Clearly Stated? No **Areas:** Cognitive
What Teacher Background is Assumed? teacher using would need some background in chemistry, physics, and perhaps geology
Other/General Comments: the text was written for a variety of (non-science) backgrounds, and appears usable with a group as an introductory course

Title: Energy: Power for People
Author: Lawrence Pringle **Issue Date:** 1975
Suggested Grade Levels: junior high (depending on reading skills) and up
Suggested Subject Areas: general background reading on energy
Media Types: 148 page book
Student Material
Cost: $6.95
Source: MacMillan Publishing Co., 866 Third Avenue, New York, NY 10022
Energy Topics: sources, supply, shortage, lifestyle
Types of Activities: none
Approaches: explains energy sources, advantages, disadvantages; discusses lifestyle and conservation
Student Outcomes: Clearly Stated? No **Areas:** Cognitive
What Teacher Background is Assumed? none, has bibliography and glossary
Other/General Comments: a good reference, background book

ENERGY MATERIALS EVALUATION

Title: Energy – 1978: Where America Stands on the Energy Crisis

Author: 3M Company **Issue Date:** 1977

Suggested Grade Levels: high school and up

Suggested Subject Areas: social studies, American government, futures, science

Media Types: booklet of background information and transparency templates

Teacher Resource

Cost: $3.95

Source: 3M Company, Visual Products Division, Box 33100, St. Paul, MN 55101

Energy Topics: systems, costs, consumption, government organization, government policy and politics, future

Types of Activities: discussions

Approaches: these visuals and background promote open-ended discussion of economic and societal interrelationships in energy issues

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? a brief background section is included, but a teacher would probably want to supplement it with much more

Other/General Comments: this set would provide an outline for a fairly comprehensive examination of interrelationships involved in energy problem

Title: Energy: Future Alternatives and Risks: Academy Forum

Author: National Academy of Sciences **Issue Date:** 1974

Suggested Grade Levels: college and adult

Suggested Subject Areas: interdisciplinary

Media Types: 229 page book

General Information

Cost: $11.50

Source: Ballinger Books, 17 Dunster Street, Cambridge, MA 02138

Energy Topics: reserves and resources; conservation and demand; environmental health and safety

Types of Activities: none

Approaches: this is a comprehensive forum report; speakers with opposing views on each of the above topics presented their views, then opened up to inquiries from the floor

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none

Other/General Comments: articulate presentation of opposing points of view

ENERGY MATERIALS EVALUATION

Title: Environment: A Human Crisis

Author: Michael Piburn **Issue Date:** 1974

Suggested Grade Levels: college (perhaps high school)

Suggested Subject Areas: social studies, values, American society

Media Types: 152 page book

Student Material

Cost: $2.98

Source: Hayden Book Co., 50 Essex St., Rochelle Park, NJ 07662

Energy Topics: sources, controversies, nuclear

Types of Activities: values discussions

Approaches: the book takes several issues, and briefly presents background on opposing views; students are left with a series of questions to discuss; some futuristic scenarios are also included as discussion starters

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? a teacher would probably want more material available on the different issues, and should be at ease in conducting intense value discussions

Other/General Comments: issues are treated rather briefly, but this could be a take-off point, especially for a group discussing values and futures

Title: Facts About Oil

Author: American Petroleum Institute **Issue Date:** 1977

Suggested Grade Levels: 9 and up

Suggested Subject Areas: science, general background

Media Types: 44 page pamphlet

General Information

Cost: free

Source: American Petroleum Institute, 2101 L Street N.W., Washington, D.C. 20037

Energy Topics: oil exploration, use, refining, statistics

Types of Activities: none

Approaches: oil company point of view

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none needed

Other/General Comments: presents a lot of information about oil from company point of view

ENERGY MATERIALS EVALUATION

Title: Fact Sheets: Committee for Environmental Information

Author: Committee for Environmental Information

Suggested Grade Levels: high school, adult

Suggested Subject Areas: science, social studies

Media Types: short papers on different topics

General Information

Cost: free

Source: Committee for Environmental Information, 560 Trinity Avenue, St. Louis, MO 63130

Energy Topics: nuclear plants, alternative energy, other subjects

Types of Activities: none

Approaches: these papers present environmentalist outlooks on energy topics

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? none needed; these are brief papers from a point of view

Other/General Comments: these are brief, simple papers on individual topics; they attempt to present a point of view not found as easily or as prominently displayed as that of utilities industry

Title: The First Book of Energy

Author: George Russell Harrison **Issue Date:** 1965

Suggested Grade Levels: 6 and up

Suggested Subject Areas: science

Media Types: 78 page book

Student Material

Cost: $3.45

Source: Franklin Watts, Inc. Publishers, 730 Fifth Avenue, New York, NY 10019

Energy Topics: types, sources, conversion, storage, use, efficiency

Types of Activities: a few simple experiments

Approaches: simple explanation of physics of energy use and transfer in day-to-day life; does not mention problems of nuclear power nor much about conservation

Student Outcomes: Clearly Stated? No **Areas:** Cognitive

What Teacher Background is Assumed? none assumed, though some complex topics are treated rather briefly; contains a glossary and many pictures and diagrams

Other/General Comments: good, low-level general information on energy

ENERGY MATERIALS EVALUATION

Title: Hot as an Ice Cube

Author: Philip Balestrino **Issue Date:** 1971

Suggested Grade Levels: 2 – 5

Suggested Subject Areas: science

Media Types: 34 page book

Student Material

Cost: $4.50

Source: Thomas Y. Crowell Co., 666 Fifth Avenue, New York, NY 10019

Energy Topics: heat and temperature

Types of Activities: a few very simple experiments

Approaches: simple concepts interspersed with pictures and experiments

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? some understanding of heat from physical sciences, for this description is rather brief and leaves a few unanswered questions

Other/General Comments: a fairly good introduction, but should be a little more extensive

Title: Solar Energy: Technology and Application

Author: J. Richard Williams **Issue Date:** 1977

Suggested Grade Levels: college and adult

Suggested Subject Areas: industrial arts, general background

Media Types: book, 190 pages

General Information

Cost: $6.95

Source: Ann Arbor Science Publications, P.O. Box 1425, Ann Arbor, MI 48106

Energy Topics: different solar energy applications, their construction, and advantages

Types of Activities: none

Approaches: extensive background information, some of it technical, on solar technology and its principles

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? though it starts with basics, it gets into details quickly; some background on basics probably desirable, has lots of diagrams of solar systems

Other/General Comments: would be a good book for someone going to teach about solar, or planning on installing a solar device

ENERGY MATERIALS EVALUATION

Title: Natural Energy Workbook

Author: Peter Clark and Judy Landfield **Issue Date:** 1976

Suggested Grade Levels: college and up

Suggested Subject Areas: general

Media Types: 128 page book

General Information

Cost: $3.95

Source: Visual Purple, Box 996, Berkeley, California 94701

Energy Topics: energy problems, politics, nuclear hazards, building ideas for solar, biological, wind, and water devices

Types of Activities: directions for different devices

Approaches: details a number of facets of energy problem and gives specific recommendations for individual action; is basically anti-nuclear power

Student Outcomes: Clearly Stated? No

What Teacher Background is Assumed? varies with sections; in general, it's fairly elementary; it contains many diagrams and much background information

Other/General Comments: this book contains quite a bit of detailed information for specific projects

Title: The Whole Earth Energy Crisis

Author: John H. Woodburn **Issue Date:** 1973

Suggested Grade Levels: junior and senior high school

Suggested Subject Areas: science, energy

Media Types: book, 190 pages

Student Material

Cost: $5.39

Source: G. P. Putman's Sons, 200 Madison Ave., New York, NY 10016

Energy Topics: use, different sources

Types of Activities: none

Approaches: gives short history of each source and use, sets forth nuclear as the future solution

Student Outcomes: Clearly Stated? No **Areas:** Cognitive

What Teacher Background is Assumed? none assumed

Other/General Comments: fairly good background book, with some attention paid to social impacts of energy use and scarcity, overworks analogy of earth being "a great big wind-up toy" . . .